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ABSTRACT

Continuous curriculum revision in community/junior colleges can be provided by treating the curriculum as a self-correcting set of systems with feedback loops and marginal sensors which supply information needed for constant system evaluation. This curriculum-related set of sub-systems is comprised of the institution, the curriculum, programs, and courses. Systematic determination of curriculum needs may be achieved through discrepancy evaluation at each of these four levels. Needed changes at each level are identified by the formula--demand minus provision equals need. Types of data needed to identify levels of demand for and provision of a product (the competencies needed for jobs or baccalaureate transfer, and basic social and personal competencies) include: general data from surveys of business concerning demands for trained personnel; numbers of personnel required for specific job descriptions in the area and nation; provision of programs to supply qualified personnel to fill expected vocational demands; and identification of specific tasks demanded to fulfill course objectives. A bibliography as well as a list of sources of information for curriculum evaluation are included. (Author/MB)

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NEEDS ASSESSMENT FOR CONTINUOUS CURRICULUM REVISION

by

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University of Texas, 1973

JC 780 486

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> Because of the way that an instructional mission-system continuously evaluates and recycles its product instructional systems, its on-going operations acquire a self-validating character. Flaws in its products tend to be automatically exposed and system-corrected as a normal internal system function. This is instruction as a science.
>
> Lawrence E. Fraley

The Community Junior College is sometimes called the "NOW" college. Its purpose is to provide for the constantly changing "now" demands of the community in which it is located. The NOW college does not have the luxury of establishing a traditional curriculum which remains constant year after year; the tradition of this institution must be a tradition of change in response to ever-changing community demands.

This paper will present a "systems" approach to the determination of needs as a basis for curriculum change. Curriculum, for the purposes of this paper, is defined as the sum of all activities within an educational institution which are oriented toward educational outcomes and have been organized into programs and/or courses of study. Although it is fully recognized that counseling and other student services and activities have definite effects on the outcomes of student learning, this paper will confine itself to needs assessment for the more formalized portion of the total CJC educational effort defined above.

CURRICULUM AS A SYSTEM

In this paper, the curriculum will be treated as a system. A curriculum possesses the necessary attributes of a system: identifiable and (to a large degree) measurable inputs, processes, and outputs. Primary inputs are students, instructors, plans, materials, space, equipment. Process involves the utilization by instructors of other inputs (plans, materials, etc.) in purposeful, sequenced activities designed to act on students toward specified behavioral ends. The primary output is people (graduates and other students) who exit the system with predictable behavioral characteristics satisfactory to themselves and to society.

Following is a diagram of a curriculum system showing information gathering, decisioning, implementation, and revision as an on-going cyclical process.

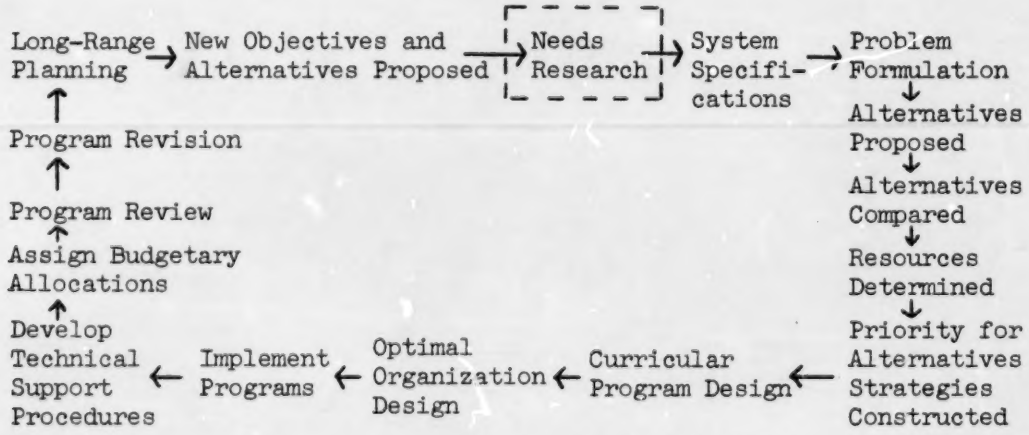

Figure 1. General Process of Educational Systems Analysis (3:70)

This paper will deal with only one portion of the total process of curriculum development: NEEDS RESEARCH.* But before we limit the

*For readings on other portions of the system shown, Hartley's Educational Planning-Programming-Budgeting is recommended as well as any other readings on PPBS, MBO (Management by Objectives), MIS (Management Information Systems), Cost Effectiveness Analysis, and Cost Benefit Analysis.

discussion to this area, let us first examine the curriculum in its relationship to institution, program, and course. The curriculum is a system located within a supra-system known as the institution; this supra-system comprises the curriculum, student personnel services, student activities, and all other activities which are under the official care of the particular educational organization. Sub-systems within the curriculum are called programs. A program is defined as a particular sequence of educational activities leading in a logical way to specific objectives, and producing a defined product. The product of a CJC program is a person who possesses specific behavioral characteristics which relate to job descriptions, societal demands, personhood development, and/or avocational interests. Programs are made up of elements--usually courses--comprising a closely-related set of components (learning experiences or tasks) which lead to the achievement of specific objectives which can be achieved by most students in a stated period of time (e.g. 3 hours' class time, plus 6-9 hours' outside study each week for 19 weeks).

Each level in this set of systems is seen as a sub-system of the next higher level. The institution comprises the curriculum and other types of student related activities; the curriculum comprises one or more programs; a program comprises one or more courses. A course is made up of one or more tasks (learning experiences). These sub-systems frequently intersect with other subsystems at their own level. A given learning experience may be included in more than one course; a given course may be included in more than one program. Other systems within the institution outside the curriculum (e.g. counseling services), in turn, have a definite effect on the outcomes of the curriculum, program, and course. The entire set of systems operates

within an environment (the community) whose changing demands constrain the institution to provide rapid response through constant curriculum revision.

Intra-system, inter-system, and extra-system feed-back loops continually inform the system of specific needs for curriculum change. Of particular importance are marginal sensors which will bring into the system information from the environment. The curriculum as it relates to the environment, the institution, program, and course is shown in the following diagram:

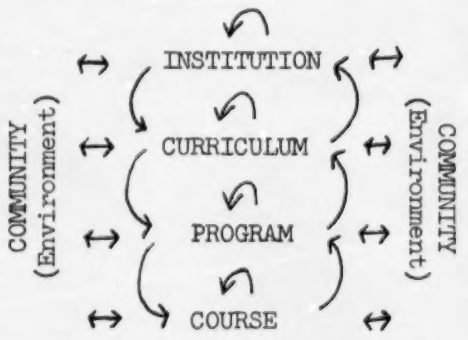

Figure 2. Set of systems related to curriculum. Each system is a supra-system to the system below; each is a sub-system to the system above. All systems interface with and react to the environment. Arrows indicate intra-, inter-, and extra-system feedback loops.

DISCREPANCY EVALUATION

For a system to be able to correct itself, it must have precise knowledge of the quantity and nature of its current product and of the quantity and nature of the product which is demanded. The curriculum system must know the nature of its current product in reference to three general areas of competence: job-related or baccalaureate transfer competence, citizenship or social competence, and personal (or personhood) competence. Stipulations concerning current production will hereafter be referred to as provision. In order to make correct

adjustments, the system must also be informed concerning the desired quantity and the desired (or required) competences in each of these competence areas. Stipulations concerning desired or required production numbers and characteristics will hereafter be referred to as demand. Needed changes in curriculum can then be identified by discrepancy evaluation:

DEMAND - PROVISION = NEED

At the institution level, the DEMAND for adult and post-secondary education in the local community must be determined, along with general descriptions of the nature of the demands. From this total assembly of demands must be subtracted the sum of current PROVISION by this institution and other local institutions (schools, industry, training programs, home visitation programs and others) which provide for any part of the identified demands. The difference will be the NEED which remains unmet in the community. The institution must evaluate this remaining need in terms of the role of the institution and determine which parts of the total need may be considered for incorporation into its curriculum. Planning for action to satisfy the determined need will require further analysis at the curriculum level.

At the curriculum level, the NEED is the discrepancy between community DEMAND for specific programs (defined by required output with specified vocational, educational, or social proficiencies) minus the sum of current PROVISION by this institution and other institutions within the community. Correction is effected by adding and/or deleting programs, by adjusting capacity of programs, or by altering program objectives, or by any combination of these.

Needs within programs are derived by determining the competencies demanded by business and industry, receiving institutions of higher learning, and/or society in general for output related to specific vocational, educational, or societal roles; determining the characteristics of the current output from appropriate programs (both students who complete the program and those who leave without completing it); and identifying discrepancies. Correction is effected by adding and/or deleting courses, or by altering course objectives, or by changing prerequisites, or by any combination of these.

Within course needs are identified by determining discrepancies between the proficiencies specified in course objectives and the actual proficiencies of students leaving the course (both those who have completed the course and those who leave without completing it). Correction is effected by adding and/or deleting course content, or by altering task objectives, or by making changes in method, or prerequisites, or by any combination of these.

Complete sets of behavioral objectives (at institution, curriculum, program, and course level) are required for operationalizing systematic curriculum development. Objectives are essential for systematic needs assessment. They also provide precise definitions of alternatives for consideration by administrators, boards, and faculty when decisions must be made concerning optimum appropriation of resources (funds, personnel, time).

DETERMINATION OF NEEDS AT FOUR LEVELS FOR CURRICULUM DEVELOPMENT

The outline which follows will serve as a guide to the general types of information required for discrepancy evaluation at each of the four levels of curriculum planning. The items included in

the outline will be recognized as a mixture of yield from intra-institutional feedback loops and marginal sensing devices.

It is recognized that, at every level of curriculum development, administrative judgments will be made concerning (1) the suitability to the role of the given institution of providing for the satisfaction of specific needs, and (2) the feasibility of implementation of changes required for a specific needs satisfaction (See Figure 1). This plan for discrepancy evaluation should, however, provide data needed for judgments on whether or not or to what degree this institution will assume responsibility for specific needs satisfaction.

The following outline by no means exhausts the types of useful data which might be gathered, but will perhaps suggest direction in needs assessment for curriculum development. Some suggested sources of information are listed in an appendix.

I. Institutional level. Evaluation of general curriculum.

A. Determination of DEMANDS: Institutional level. Whether or not post-secondary and community service education is demanded in the community. With what general curriculum goals?

1. General data from surveys of business and industry concerning demands for trained personnel (several years' projection).
2. Aspirations of teen-agers and their parents concerning post-secondary education; estimated numbers.
3. Aspirations of adult population concerning further education of the types which may be offered by a CJC (by general type: vocational/technical, baccalaureate, basic education, etc.).
4. Educational demands identified by social service agencies, etc. (hygiene, nutrition, basic language and computation skills, sewing, home care, vocational training, etc.).

B. Determination of PROVISION within the community.

1. Current general institutional goals, quantity and quality of current output.

2. Other provisions in the area for fulfilling these demands.

C. DEMAND - PROVISION = NEED FOR INSTITUTIONAL CHANGE

1. Need to open new institution or close existing institution.

2. Need to alter goals of existing curriculum.

II. Curriculum level. Evaluation of program offerings within the curriculum.

A. Determination of DEMANDS: Curriculum Level. Whether or not specific programs are required in the curriculum. Which programs? with what general objectives?

1. Vocational/technical programs.

a. Numbers of personnel required for specific job descriptions in area and in nation (suggested five-year projection).

b. Numbers of secondary school students interested in each of the vocational/technical areas for which there is demand.

c. Specific characteristics which should be present to qualify personnel for specific positions (job descriptions).

2. Baccalaureate programs (lower division).

a. Numbers of professional (and other baccalaureate) personnel demanded in area and in nation, by professions (suggested ten-year projection).

b. Numbers of secondary school students (and parents) who express interest in baccalaureate education for themselves (their children).

c. Numbers requiring low-cost, local baccalaureate education.

d. Prerequisites (course credits) and proficiencies (behaviors) required for entry and success at receiving institutions in the area (entering at full junior level and with provision for special majors such as pre-engineering, pre-architecture, etc., as demanded).

3. Continuing education and community service programs (adult basic education, avocational, upgrading, refresher, and other programs).

4. Characteristics demanded by society for socialization and citizenship.

5. Characteristics desirable for optimum personal satisfactions in probable life-style (in keeping with vocational aspirations with options to allow for individual preferences).

6. Adequate provision for inter-program transfer with minimum loss of credit.

7. Minimum entry skills-level required (in keeping with community demands).

B. Determination of current PROVISION in this curriculum and elsewhere.

1. Programs currently offered in community to provide qualified personnel to fill expected vocational/technical demands and to meet demands of students' vocational preferences.

a. Provision in this institution.

(1) Numbers of current production (by programs).

(2) Characteristics of current product (by programs).

b. Provision made (quantity of production) by other institutions in area (all programs which are accessible to students and have cost, entry level requirements, and general qualifications on exit in keeping with the demand).

2. Provision for baccalaureate education (lower division).

a. Number of secondary students who plan to go outside community for lower-level baccalaureate education (provision made outside community).

b. Number of places available in other two-year and four-year institutions in community (provided cost can be matched with ability to pay).

c. Number of places currently provided by this institution.

d. Credits and proficiencies now being achieved by students in lower-level baccalaureate education in this institution.

3. Provision for continuing education and community service programs.

a. By this institution.

b. By other schools and agencies in the community.

4. Current minimum social/citizenship objectives common to all programs (with possible exception of avocational and special interest short courses).

5. Current objectives (by programs) for personhood development (with provision for student option of alternative "life-style" or enrichment objectives).

6. Current provision for inter-program transfer.

7. Lowest entering skills-level provided for.

C. DEMAND - PROVISION = NEED FOR CURRICULUM CHANGE

1. Need to add or delete programs; increase or decrease output.
2. Need to alter program objectives (vocational/technical/baccalaureate, social, personal).
3. Need to provide greater flexibility for inter-program transfer.
4. Need to alter provision for entering skills level.

III. A. Determination of DEMANDS: Program level. What courses should be offered within the program? servicing which program objectives? What course objectives should be stated for each course in the program?

1. Optimum distribution of program objectives to courses--vocational/educational, social, personal (more than one objective may be served by a single course and more than one course may serve a single objective).
2. Expected student entry level.
3. Optimum logical sequencing of objectives and courses.

B. Determination of current PROVISION within the program.

1. Current distribution of program objectives to courses.
2. Entry level for which provision is currently made.
3. Current sequencing of program objectives and courses.

C. DEMAND - PROVISION = NEED FOR PROGRAM CHANGE

1. Need to add or delete courses.
2. Need to alter course objectives.
3. Need to alter provision for entry level.
4. Need to make adjustments in sequencing of program objectives and courses.

IV. Course level. Evaluation of inputs and processes within courses.

A. Determination of DEMANDS: Course level. Optimally what will be the specific task objectives for this course? What is the nature of optimum inputs into course to insure most effective process and optimum product? What are optimum processes?

1. Specific task objectives demanded to fulfill assigned course objectives.
2. Content, method, experiences required for students to be able to meet all objectives.
3. Optimum logical sequencing of content and experiences within course.

4. Provision required for entry level to meet demand.
5. Optimum completion rate.*

B. Determination of current PROVISION within the course.
1. Current specific task objectives.
2. Content, method, experiences now offered to enable students to meet objectives.
3. Current sequencing within course.
4. Current provision for entry level.
5. Current completion rate.

C. DEMAND - PROVISION = NEED FOR COURSE CHANGE
1. Need to change task objectives.
2. Need to add or delete content.
3. Need to add, delete, or adjust learning experiences.
4. Need to adjust sequence of objectives, content, and learning experiences.
5. Need to make different provision for entry level.

SUMMARY AND CONCLUSION

Optimum provision for continuous curriculum revision in community junior colleges is provided by treating the curriculum as a self-correcting set of systems with feedback loops and marginal sensors to provide information needed for constant system evaluation. This curriculum-related set of systems usually comprises a series of supra-systems and sub-systems: the institution, the curriculum, programs, and courses. Systematic determination of curriculum needs may be achieved through discrepancy evaluation at each of these four levels. Types of data needed for evaluation at each of these levels have been outlined, and a list of suggested data sources is appended.

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*The view is held that the community college should offer open opportunity for educational and career-choice exploration without penalty for "false starts." Therefore, "optimum" completions $\neq$ 100%. Institutional research on "causes for leaving" is necessary to establish an estimate of optimum completion rate in a given institution.

Full optimum implementation of a curriculum development system (Figure 1) implies the presence of complete sets of behavioral objectives at every level of the institution, the implementation of Management by Objectives, of a Planning-Programming-Budgeting System, and of a Management Information System. Parts of the evaluation method presented in this paper can, however, be implemented in institutions which lack these sophistications. The first and most important step is to eradicate the notion that education is pure art and that curriculum planning occurs through bursts of inner wisdom or inspiration. Education, treated as a science, will surely lend itself to rational improvement through systematic curriculum development techniques.

BIBLIOGRAPHY

1. Fraley, Lawrence E. "Comprehensive Instructional Mission-Systems for Universities." Educational Technology, XII, No. 5 (May 1972), 18-21.

The writer explains the use of systems approach to the development of educational programs. Emphasis is on the self-correcting nature of the true system.

2. Gardner, Robert J. and Pratton, Don L. "Curriculum Reform Through Behavioral Objectives." Junior College Journal. Vol. 41, No. 2, (October 1970), 13-16.

This article brings out the importance of complete sets of behavioral objectives for intelligent curriculum development. Particularly stressed is the value of such objectives to administrators and boards in defining precise alternatives when allocating resources and in focusing data collection for evaluation.

3. Hartley, Harry J. Educational Planning-Programming-Budgeting: A Systems Approach. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968.

The author proposes a completely systemetized approach to needs assessment, planning, implementing and revising educational programs.

4. Klein, Stephen, Fenstermacher, Gary and Alkin, Marvin C. "The Center's Changing Evaluation Model." Evaluation Comment, Vol. 2, No. 4 (January, 1971), 9-12.

A model is presented which provides for the systematic development of educational programs through a systems approach: needs assessment, program planning, implementation evaluation, progress evaluation, and outcome evaluation. Evaluations throughout are on the discrepancy evaluation principle.

5. Provus, Malcolm. Discrepancy Evaluation for Educational Program Improvement and Assessment. Berkely, California: McCutchan Publishing Corporation, 1971.

The author presents a discrepancy evaluation model for program development which provides for evaluation at five stages of program development. He presents a case study in which the method was applied to the development of a standard speech program for junior high school students. Critiques by five outstanding theorists are presented followed by adjustments in the model in reaction to the critiques.

6. Quinby, Edgar A. "Needed: Rational Curriculum Planning," Junior College Research Review. Vol. 4, No. 6 (February 1970), 2-4.

A hierarchy of curriculum objectives is recommended for consistent and systematic curriculum development. The hierarchy ranges from broad purposes for schooling (aims) to statements of specific behaviors the student will exhibit as evidence of specific learning (instructional objectives). Each level of objectives in the hierarchy is derived from the next higher level.

7. Reindeau, Albert J. The Role of the Advisory Committee in Occupational Education in the Junior College. Washington, D.C.: American Association of Junior Colleges, 1967.

This monograph explains the role of the advisory committee as linkage with the community in the development of the community college curriculum. Chapter 4 offers suggestions concerning the function of the advisory committee in continuing program review and development.

APPENDIX

SOURCES OF INFORMATION FOR CURRICULUM EVALUATION

The sources of information which may be tapped for use in curriculum evaluation and development are as many and varied as are community colleges themselves and the communities which they serve. The list offered below is not exhaustive, but will offer suggestions to help the administrator get started on systematic evaluation of curriculum.

The list moves generally from the area of broadest scope (community) to the area of smallest scope (course), but many of the sources listed may be used at more than one level in the curriculum hierarchy of systems. It will be seen that intra- and extra-system feedback is represented, but no effort has been made to differentiate between these nor to identify the listed items with particular feedback loops.

US Census Report
Statistical Abstract of the US
National Bureau of Labor Statistics
Occupational Outlook Handbook, US Department of Labor
Office of Economic Opportunity, Community Profile Center
Federal Manpower Surveys
Federal Manpower Agencies
State Planning Office
State Department of Labor
State and Regional Manpower Surveys
State Almanac and Industrial Guide
Employment Security Office
State Board of Education
Regional Studies for Industrial Dev.
Local Tax Records
City and County Data Book
City and County Planning Boards
Social Service Agencies (Welfare Dept.)
Chamber of Commerce
Civic Clubs
Parent Teacher Associations
Leaders of Volunteer Organizations
National and Local Grange
Linkages with ethnic groups: Block Clubs, Tenant Rights Councils, Welfare Rights Commissions, Urban League, Human Relations Council
Survey of area post-secondary education
Survey of social service programs
School enrollment records
Survey of high school students (aspirations and intentions)
Questionnaires to parents
Newspaper check-list questionnaires
CJC Planning Board: representatives from agriculture, education, social welfare, government, business, and disadvantaged
Curriculum Committee (faculty, administrators, counselors, students)
Consultants
Advisory Committee (Curriculum): representatives from four-year colleges and from variety of businesses and industries; from social services
Advisory Committees (programs)
Faculty visits to industry, colleges, other community colleges
Part-time instructors and lecturers (active in field of specialization)
Schedules of courses in programs
Schedules from programs in other schools
Course syllabi
Syllabi from similar courses in other schools
Other information on successful innovations
Completion rates and grade distribution (by program, course, and instructor)
In-progress student questionnaires (by program, course and instructor)
Follow-up questionnaires: drop outs
Follow-up questionnaires: graduates

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